ALTERNATIVES FOR IMPROVING PRODUCTION, EMPLOYMENT AND INCOME DISTRIBUTION IN KENYAN AGRICULTURE

BY

W.M. MWANGI

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INSTITUTE FOR DEVELOPMENT STUDIES
UNIVERSITY OF NAIROBI
P.O. Box 30197
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ABSTRACT

The ever increasing population pressure with concomitant increasing food demand, land fragmentation and employment pose major challenges to agricultural development in Kenya.

In this paper we explore various ways in which the Government can concentrate its scarce resources to accelerate production growth and employment in agriculture to at least keep abreast of population growth. These measures include land use intensification, shift in cropping patterns, land redistribution, increased supply of land and dry land farming. The second part of the paper examines the various Government policies directed towards agriculture and attempts to assess their impact on income distribution. The policies considered here include pricing, marketing, credit, research, extension and land policy.

Most of the future increase in production will have to come from higher productivity, but increasing yields is going to cost money: for irrigation, import of inputs like fertilizer, farm-to-market transport and the entire range of infrastructure soft ware such as research, extension and credit. Thus the country will need much higher levels of investment than at present especially in smallholder sector. Technically there seem to be few problems outside the feasible range of currently available possibilities. But the perennial issues of management and institutional structure will pose the biggest problems.

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INTRODUCTION

This paper has two major parts: The first part explores various ways in which the Government can concentrate its resources to accelerate production growth and employment in agriculture to at least keep abreast of population growth.

The second part examines various Government policies directed towards agriculture and attempts to assess their impact on income distribution.

1. SOURCES OF INCREASED PRODUCTION AND EMPLOYMENT

Kenya is faced with an acute shortage of land of high potential (about 12% of total land area) and one of the highest population growth rates in the world - at about 4% per annum[1]. However, despite the acute shortage of land of high potential, the average output per hectare is much below the economic potential. Given this prevailing situation, output can easily be doubled through substantial increase in inputs, better cultural practices, favorable prices and improved technology but institutional factors may be limiting. The major strategy would then appear to be that of using land intensively given the availability of high yield - increasing technology (Ruthernberg, 1978) [2].

1.1 Land Use Intensification

Most of the potential for increased output and employment is in the high and medium potential areas which are also areas of high population density especially Nyanza and Western Provinces [3]. Rural poverty is also concentrated in these two provinces. These two provinces account for 60.5% of the total poor in the country (Crawford and Thorbecke, 1978).

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1. Economic Survey (1979) estimates population growth rate at 3.9%. This would result in a population of about 34.4 million in the year 2000. The numbers in Urban areas should go from 2 to 8 millions.

2. Ruthenberg, 1978. The first part of the paper frequently draws on Ruthenberg's paper.

3. The average population density in Kenya is no more than 8 per square kilometre but that in high and medium potential areas is 49 per square kilometre.

The strategy of land use intensification would call for higher yields per hectare of crop; increase of the hectarage under crops with a high employment content and encouraging of multiple cropping. These would in turn call for provision of agricultural innovations through research and extension and provision of inputs.

1.2 Shift in cropping pattern

Changing cropping pattern on existing land can have substantial impact on production and employment.

Tables 1 and 2 show the employment coefficients for different crops on small and large farms and Table 3 shows the range of value added per hectare amongst five principal crops in 1975. From Tables 1 and 2 one can see that there is a big range in the employment and production potential of different crops.

Table 1 shows for example that tea provides four times as much employment per hectare whereas in Table 3 tea has nearly as much value as smallholder maize. Table 1 and 2 show a more dramatic picture where smallholder potato production uses more than 15 times as much labour per hectare as large farm wheat production while smallholder pyrethrum uses 40 times as much labour per hectare as large farm wheat production [4]. The data in Table 1 and 2 further indicate that except for horticultural crops i.e. bananas, flowers, vegetables and other fruits the diversification away from cash crops especially coffee, tea, cotton, pyrethurm and sugar cane does not offer much alternative. But the dilemma here is that concentration on their production increases the dependency on erratic world markets and bring an element of economic instability in the development of the country (Ruthenberg, 1978). Further their production is limited by shrinking demand for them in the world market.

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4. Tidrick (1979) has noted that it is difficult to disentangle the effects of changes in cropping patterns from changes in farm sizes.

TABLE 1: ESTIMATED CROP HECTARAGE, LIVESTOCK, AND EMPLOYMENT IN THE SMALL FARM SECTOR, KENYA (IRS-1, 1974 - 1975)

T O T A L

	Crop	Hectares	Hours/Ha	Total Hours
1.	Cereals, Pure Stands			
	Local Maize	224,600	800	179,680,000
	Hybrid Maize	258,200	900	232,380,000
	Finger Millet	30,500	1,000	30,500,000
	Sorgum	16,800	300	13,440,000
	Other Cereals	18,500	700	12,950,000
				468,950,000
2.	Cereals, Mixed Stands			
	Loc. Maize, Beans, Sweet Potatoes	834,000[1]	800	667,200,000
	Hybrid Maize, Other	242,600	900	218,340,000
	Sorghum, Grain Legumes, etc.	97,600[1]	700	68,320,000
				953,860,000
3.	Pulses, Pure Stands			
	Beans	49,900	400	19,960,000
	Cow Peas	11,700	300	3,510,000
	Pigeon Peas	100	400	40,000
	Field Peas	4,100	600	2,460,000
	Groundnuts	3,500	800	2,800,000
	Other	1,100	300	330,000
				29,100,000

TABLE 1: CONTINUED

4. Root Crops, Pure Stands

English Potatoes
Sweet Potatoes
Cassava
Other

5. Fruit, Vegetables, Oilseeds, Pure Stands

Bananas
Other Fruits
Vegetables
Oilseed

6. Industrial Crops, Pure Stands

Sugar Cane
Pyrethrum
Cotton
Other

7. Cotton, Mixed Stands

8. Permanent Crops, Pure Stands

Coffee
Tea
Coconuts
Cashew
Other

48,900	1,100	53,790,000
10,900	1,000	10,900,000
41,200	1,100	45,320,000
17,700	1,000	17,700,000
19,600	1,100	21,560,000
1,200	1,000	1,200,000
4,000	2,000	5,000,000
13,000	800	10,400,000
55,000	1,500	82,500,000
22,400	2,800	62,720,000
25,000	1,500	37,500,000
2,600	1,000	2,600,000
45,100	1,000	45,100,000
92,000[2]	2,500	230,000,000
59,000[3]	3,200	188,800,000
2,000	200	400,000
5,500	200	1,100,000
23,100	500	11,550,000

TABLE 1: CONTINUED

9. Permanent Crops, Mixed Stands			
Coffee-Bananas-Maize	19,300	2,100	40,530,000
Coconut-Cassava-Maize	49,300	1,200	59,160,000
Cashew-Cassava-Maize	48,000	1,200	57,600,000
Sub-Total	2,397,300		2,440,340,000
Minus Area: Double-cropped (15%)	395,595		366,051,000
Total Crop Hectarage	2,037,700		2,074,289,000[9]
Plus Pastures, etc.	1,420,300		
Total Small Farm Hectarage	3,458,000		2,074,289,000[10]
Livestock Type	Number Animals	Hour Head/Year	Total Hours
Dairy Cows (Improved)	611,000	400	244,400,000
Calves, Heifers (Improved)	661,448	250	165,362,000
Bulls, Steers, Oxen (Improved)	185,552[4]	200	37,110,400
Unimproved cows	1,942,000	300	582,600,000
Unimproved Other Cattle	3,435,000	200	687,000,000
Sheep and Goats	6,522,000	25	163,050,000
Total			1,879,522,400[6]

TABLE 1: CONTINUED

Total Employment	Hours	Percent of Total	
Total Crops (less double-cropping)	2,074,289,000	46.4	
Food Crops[11]	1,368,823,000		66.0
Industrial Crops[12]	204,697,000		9.9
Plantation Crops[13]	500,769,000		24.1
Total Livestock	1,879,522,400	42.0	
General Farm Work[7]	517,891,000	11.6	
GRAND TOTAL	4,471,702,400[8]		

Source: Crawford and Thorbecke, 1978, Chapter III

Pastures: Estimated as follows:

	Pasture
West	325,525
Rift	146,758
Nyanza	271,574
East	214,384
Coast	1,000
Central	461,059
	1,420,300

1. Residual after substracting pasture and all other crop area from total holding area: 3.458 - 1.435 - 1.466.4 million ha. = 931,600. IRS Table 9 gives total mixed local maize area = 970,000 ha; mixed sorghum = 189,600. These undoubtedly involve overestimation and double counting.

2. Coffee Board says 86,389 x 2,500 = 215,972,500 : 427,044,500 versus 418,800,000 above; difference of 2%

3. Tea Board says 65,960 x 3,200 = 211,072,000

4. Proportional split of total 847,000

TABLE 1: CONTINUED

5. Ruthenberg breakdown of IRS 1974 and 1975 average number of cattle.
6. Average hours of livestock times number of holdings: 1,368 x 1.48m = 2,029,321,296, of which 6 is 93%.
7. Approximately 350 hours x 1.48 million holdings.
8. + 2,000 = 2,235,851

   + 2,400 = 1,863,209

   Total - general = 3,953,811,400, which is 1,976,906 at 2,000 hours and 1,647,421 at 2,400 hours/man-year.
9. Average 1,018 hours/ha. of crops.
10. 89% of norm by IRS: 1,579 hours x 1.48m.
11. Categories 1-5 minus oilseeds.
12. Categories 6 + 7 + oilseeds.
13. Categories 8 + 9.

TABLE 2: ESTIMATED CROP HECTARAGE AND EMPLOYMENT IN LARGE-SCALE FARMING IN KENYA, 1976

Crop	Hectares[1]	Hours/Ha[2]	TOTAL Total Hours
1. Large Mixed Farm Crops			
Wheat	86,595	70	6,061,650
Barley	13,141	70	919,870
Oats	4,153	70	290,710
Maize	74,317	350	26,010,950
Other Grains	1,164	70	81,480
Sunflower	3,890	120	466,800
Pyrethrum	3,036	2,000	6,072,000
Root Crops and Vagetables	3,527	3,000	10,518,000
Tamporary Fodder Crops	8,500	70	595,000
Other Temporary Crops	115,596	200	23,119,200
Other Crops	265	200	53,000
Total	314,184		74,251,660
Squatter Maize	300,000[2]	800	240,000,000
2. Plantation Crops			
Tea	25,301	4,300	108,794,300
Coffee	29,841	2,800	83,554,800
Sugar Cane	30,098	1,000	30,098,000
Sisal	76,994	300	23,098,200
Pineapple	5,033	1,500	7,549,500
Wattle	11,779	200	2,355,800
Coconuts	1,636	200	327,200
Cashew	1,121	200	224,200
Other	3,063	500	1,531,500
Total			257,533,500

TABLE 2 CONTINUED

		Numbers	Hours/Head/Yr.	Total Hours
3.	Livestock			
	Dairy Cows	175,100	200	35,020,000
	Heifers	95,800	20	1,916,000
	Calves, Bulls, etc.	19,200	24	460,800
	Beef Cattle	456,500	20	9,130,000
	Sheep	325,700	2	651,400
	Pigs	18,100	2	36,200
	Total			47,214,400

4.	Summary		% of Tatal
	Total Mixed Farm Crop Hours	74,251,660	12.0
	Total Plantation Crop Hours	257,533,500	41.6
	Total Livestock Hours	47,214,400	7.6
	Squatter Maize	240,000,000	38.8
	Sub-Total	618,999,560	100.0
	Overhead Labour (20%)	123,799,912	
	GRAND TOTAL	742,799,472[3]	

Source: Crawford and Thorbecke, 1978, Chapter III

Notes:
1. Statistical Abstract, 1977, Table 97 (e)
2. Estimate based on Huntings, "Large Farm Sector Study", 1977.
3. = 371,400 employed at 2,000 hrs./man; 309,500 at 2,400 hrs.

Table 3: Value added per hectare of selected crops, 1975.

Crop (K.SHS.)	Value added
Maize	12051
Coffee	5742
Tea	2171
Pyrethrum	2353

Source: McLouglin, 1977

1. Value added is in domestic prices and is the average for medium efficiency farms.

However, if one were concerned only with direct employment, the national cropping patterns should favour the following crops viz. coffee, tea, pyrethrum, sisal and sugarcane. The creation of employment is of great concern as the following statement from President Moi indicates:

"Perhaps the greatest challenge to leaders both in Government and in the private sector is to provide more employment opportunities. Every year we need to provide nearly 250,000 new jobs for the young people who join our labour force. —— This is not an easy task, particularly in a time of austerity. Wage employment outside of agriculture is small, and the number of new non-agricultural jobs created each year can satisfy only a fraction of the people seeking employment."[5]

Although it would appear from Table 1 and 2 that shifting of cropping patterns can offer substantial increase in output and employment we should not be disillusioned to think that changes in cropping patterns are a panacea to our production and employment problems. There are limits to this operation which include land quality, product demand, the need to fit crops into the farming system, inadequate supporting services and consumption patterns.

Tea for example has a higher value added per hectare than maize on average but there will be many areas in which maize will have a higher return per hectare than tea due to land quality.

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5 Presidential address to the Leaders' Conference at Kenya Institute of Administration (KIA), Daily Nation (Nairobi), July 22, 1980.

The International Agreements such as the one for coffee will limit the expansion of such crops as coffee. Thus product demand is a limit to changing cropping patterns. Changing cropping patterns can be limited by the need to fit crops into the farming system. The labor profile in a farming system is critical because peak season labor requirements may constrain production of some high-value, labor intensive crops. This means that comparison of the annual labor requirements of crops can be very misleading.

The supporting services available to the farmers can be a limit to changing cropping patterns. Well known examples in Kenya are vegetables and potato production which are usually limited by inadequate storage and marketing facilities. Yet from Table 1, one observes that potato production has a very high employment component.

The final limit to changing cropping patterns is consumption patterns. Here wheat is a good example. Producers have followed the dictates of consumers. Demand for bread increases at a rate between 6 - 8% per annum. The production of wheat continues to be promoted despite the fact that wheat is a costly crop to the nation. The income per hectare of high potential land is relatively low. The employment content is negligible as indicated in Table 2. Its foreign exchange requirement is very high since it requires high inputs of imported machinery.[6] Here one only hopes that high wheat prices as well as the development of triticale will change consumption patterns in the long-run. Kenyan farmers are exceptionally price responsive and one hopes that an enlightened pricing policy can have a large impact on cropping patterns.

However, given the above limitations there is still considerable room for increasing output and employment by changing cropping patterns. Changes in cropping patterns in Central Province between 1963 and 1974 increased labor demand by 28% or 2.3% per annum (Collier and Lal, 1979). This mainly involved expansion of tea, coffee, and hybrid maize at the expense of less labor-intensive crops. In future similar or higher gains for changing cropping patterns should be experienced throughout the economy. The main requirement

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6 But wheat can be grown without a high level of mechanization by smallholders. This has been clearly demonstrated in Asia. In Kenya there has not been much promotion of wheat production by smallholders. Smallholders in Kibirichia, Meru have attempted to grow some wheat and these farmers could be used for base line studies to indicate whether smallholder wheat production is feasible relative to maize which is the staple food.

is policy and institutional support: pricing policy, marketing and transport facilities, credit arrangements, improved input distribution, off-farm economic opportunities and research into ways to ease constraints which prevent adoption of high-value, labor-intensive crops (Tidrick, 1979).

1.3. Increased Yields through Intensification of land use.

Yield increases are an important source of output growth. The average yields in Kenya are low and they could be doubled through application of known best-practice technology. The average yield of maize for example, is about one tonne per hectare, compared with 1.95 tonnes in Mexico and 5.4 tonnes in the U.S.[7] But to get the best-practice technology will cost scarce resources.

Increased yield in labor-intensive crops such as tea, coffee, sugar-cane, pyrethrum and cotton will generate significant employment especially for harvesting.

However, achievement of doubling or increasing yield substantially is not automatic. Ruthenberg (1978) contends that yields may have stabilized or actually fallen in recent years especially among smallholders. He attributes this to the low use of fertilizer in smallholder agriculture. This low fertilizer use is in keeping with the trend in rest of Africa which is estimated at 4.4 kilograms per hectare compared to 45.4 and 38.8 for Asia and South America respectively (FAO, 1978).

If yields are to be increased or doubled the current trend of fertilizer use by small-farmers must be increased. This will hinge upon Government policy and institutional support. The issue here is not farmers' technical capability of raising yields using fertilizer but rather the profitability of fertilizer use, its availability at the correct time, at reasonable distances from farmers' fields and credit facilities.

Given the incentive there is ample evidence that smallholders can respond to fertilizer use. Kenya Tea Development Authority (K.T.D.A.) is

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7 Financial Times - Special supplement of Kenyan Economy, July 28, 1980.

a good example, where fertilizer use in tea growing has been promoted with much success. K.T.D.A. provides fertilizer to farmers close to their fields, provides credit, and farmers get fertilizer at the right time and when they need it.

The general marketing of fertilizer to small farmers has been a limiting factor to fertilizer use. Farmers do not get fertilizers at the correct time, dealers do not extend credit, fertilizers are packed into 50 to 100 kgs. bags and most farmer cannot afford the prices of these large quantities. The dealers are not localised as in the case of K.T.D.A. and farmers have to travel long distances and transport costs are prohibitive.

The study by Mwangi (1978) in Central Province of Kenya indicated that on average farmers travelled eight miles to buy fertilizers. Forty-two per cent of all farmers using fertilizers transported their fertilizer by means of public transport (matatu), while 38% transported their fertilizer on foot. The average return fare for farmers was K.Shs. 2.50 and average transport cost for a 50 kgs. bag was K.Shs. 1.45. These costs raised the price of fertilizer substantially, not including the opportunity cost of the time spent in going to buy fertilizers. The study found that 59% of the farmers were not using fertilizers at all due to lack of funds, while the same lack of funds made 68% of farmers use inadequate fertilizer.

Thus, for yields to be increased or doubled conditions must be created that are conducive for small farmers to use fertilizers. The areas that need special attention are price policy, institutional support especially marketing, credit and extension.

1.4 Land Redistribution

In this section we shall discuss redistribution of large holdings as another way of increasing the intensity of land use. The burning issue of land policy will be discussed in part two of this paper which will be dealing with Government policy and institutional support to agriculture.

Tidrick (1979) has observed that few would dispute that land redistribution could increase agricultural employment, but the effect on output is much more controversial. But after analysing the available data especially from Integrated Rural Survey I (IRS I), 1974 - 75 he has concluded that, on average, small farms have both higher employment and higher output per hectare than large farms using comparable quality land.

Table 4 shows the current distribution of holding and employment. If we assume, for example, as Tidrick (1979) did that there are about 585,000 hectare of large mixed farms not already subdivided plus gap farms (1 million hectares) would be subdivided. And further assume that subdivided holdings would provide .64 man-years employment per hectare (the average for all smallholdings in 1974-1975) compared to about .09 average employment on large mixed farms amd gap farms. Under these assumptions, land redistribution would provide an additional .55 man-years of employment per hectare on 1,585,000, or approximately 870,000 extra jobs. From this one example it is clear that land redistribution would go a long way to alleviate the problem of unemployment. In fact Tidrick (1979) on further calculations using other assumptions shows that land redistribution can create approximately 4 million extra jobs. But he places a caveat on this conclusion because these calculations of employment and output potential of redistribution make strong assumptions about land quality on large and gapfarms and about the political feasibility of redistribution.[8]

The discussion so far on potential to increase output and employment has been concentrated on existing land area under cultivation. We now turn into exploring the possibilities of increasing output and employment through increased supply of agricultural land. The supply of agricultural land can be expanded through irrigation, drainage, or conversion of forests and pastures.

2. INCREASED SUPPLY OF AGRICULTURAL LAND

2.1. Irrigation and drainage.

Irrigation and drainage have a substantial potential for expansion of Kenya's cultivable land in the medium and long term. Irrigation potential is estimated at about 600,000 hectares while the country's potential for reclamation through drainage is also as high as 600,000 hectares. At present less than 5% of irrigation and 1% of drainage potential has been developed (Toskoz, 1980).

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8 Recent Parliamentary debates indicate that the political feasibility of land redistribution will be difficult to realize other than through market forces.

TABLE 4: DISTRIBUTION OF HOLDINGS AND EMPLOYMENT

	Number of farms	Area Hectares	Approximate Average holding size hectares	Employment (thousands)	Employ-ment per hundred hectares
Small farms	1,704,000	3,500,000	2	2,236	64
Irrigation shcemes	4,744	8,728		5	60
Gap farms[1]	40,000	1,000,000	25	80	8
Large farms	2,460	2,500,000	1,000	371	15
Mixed farms	1,800	900,000[2]	500	200[3]	22
Plantations	475	185,000[4]	390	129	70[4]
Commercial ranches[5]	100	650,000	6,500	-	-

Source: Employment and gap farm data are from Crawford and Thorbecke, 1978, Chapter III; large farm number and area data are from Hunting, 1977, Chapter 4; number of small farms based on IRS-II (Casley and Marchant, 1978, p. 8); area of small farms from IRS-I (Kenya 1977); irrigation schemes from Kenya, Statistical Abstract.

1. Gap farms are those not covered by either the Integrated Rural Survey or the large Farm Survey. Most are believed to be 20-50 hectares in size. Area and average size are estimates. Small farms are less than 20 hectares amd ;arge farms are greater than 50 hectares.
2. Up to 35% of this area has been subdivided into smallholdings.
3. Includes estimated 144,000 squatters in large farm areas.
4. Cropped area only.
5. Ranches larger than 1000 hectares. Government-operated ranches are excluded.

Toskoz (1980) has estimated that the development of 200,000 hectares of irrigation and 200,000 hectares of drainage covering only one-third of Kenya's potential would cost K.£ 1400 million. This would in turn generate full time equivalent employment potential of nearly 1.3 million people as compared to the expected 7 million increase in labor force between 1979 - 2003.

Irrigation could also provide substantial production benefits. The projected value added under the Bura project is around K.£ 450 per hectare in 1979 prices. At that rate, increased value added would be K.£ 270 million if potential is 600,000 hectares.

But the potential employment and production of irrigation must be treated with caution for two basic reasons. First, irrigation is enormously expensive. The latest cost estimate of the 6,700 hectare Bura scheme is K.£ 63 million or about K.£ 9400 per hectare. However, this scheme is particularly expensive because of heavy infrastructure expenditures which would not all be required in a less remote area.

The Ministry of Agriculture (MoA) estimates that the cost of irrigation development including additional infrastructure costs but excluding much of the cost of dam construction would range between K.£ 3000 - K.£ 6000 per hectare (which might be a conservative estimate). Thus the development cost of 6000,000 hectares would range between K.£ 1.8 to K.£ 3.6 billion. This is a big investment by any developing country standard.

The second reason for calling for caution in irrigation development potential is the technical and economic problems which have a risen in some irrigation schemes. Although the Mwea scheme is generally recognized as highly successful, other irrigation schems in Kenya have been less so. Tidrick (1979) notes that Perkerra has been regarded as a disaster while the latest cost estimates for the large Bura scheme have lowered the economic rate of return to 9% which makes it a marginal project and raises questions about the economic viability of large - scale irrigation. Furthermore the availability of the long-term capital needed for investment in irrigation as well as irrigation engineers might not be forthcoming which will tend to create another bottleneck. In light of all this, the potential of irrigation development as a major source of increasing production and employment is doubtful.

The Government's strategy for irrigation seems highly appropriate under the circumstances. That strategy is to proceed cautiously with

presently planned large scale irrigation schemes, make no new large-scale commitments, and promote small-scale and private irrigation development (Tidrick, 1979).[9]

2.2 Drainage Development.

Unlike irrigation, there has been little investment in drainage. Yet drainage cost is only K.£ 400 per hectare compared to over K.£ 3000 per hectare for irrigation. However, in the Fourth Five-Year Plan there is a commitment to drain about 3,000 hectares in Coast Province to produce wet rice (Kenya, 1979).

Ruthernberg (1979) has been the staunchest advocate of drainage and valley bottom development in the MoA. He claims the following advantages to increasing the supply of land through drainage:

1) Some of the most fertile land is found in poorly-drained valley bottom. This land would respond well to the application of fertilizer and have a lower risk of drought.

2) Drained land could support very labor-intensive cropping and most of the potential products (rice, vegetables and cotton) would find a ready market in Kenya.

3) Drainage shows a high rate of return and results in permanent improvement.

4) Valley bottom development is closely connected with resources conservation because it implies water control, land leveling, and protection of catchment areas.

He estimates that up to 1 million hectares of high and medium potential land with impeded drainage exists. Most of this land is in Western Kenya, but there are also extensive areas in Coast and Rift Valley Provinces. In Central Province the importance of drainage is minor. In Kenya despite the above advantages of drainage development, there has been

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9 MoA has created small scale irrigation unit to promote small scale irrigation.

little drainage development because Kenya has little experience with drainage and valley bottom development. But this lack of valley bottom development might be due to realization that this development might have negative impact on dry seaon grazing.

In valley bottom farming there are substantial externalities involved. Investment in drainage by one farmer will benefit neighbouring farms, but it will also be unproductive if neighbouring farms do not also invest in and maintain their part of the drainage system. This implies that if drainage development is to be effective the Government would have to devise new institutions and procedure to coordinate planning. Because of the externalities involved in drainage maintenance participation in drainage development cannot be voluntary. The Government would also have to device special arrangements to ensure equitable sharing of costs and benefits of drainage development.[10]

2.3. Clearing of forests.

Clearing of forests is another possibility of increasing the supply of arable land for crop development. But this is a controversial proposal because of its unknown ecological effects. The recent Government ban on cutting trees for charcoal underscores the ecological argument.

From an economic point of view proponents of this idea argue that tea and other crops like bananas can provide adequate water shed, while providing a large increase in employment and value added. From Tables 2 and 3, Tidrick (1979) indicates that a hectare of tea provide about two man-years of employment and K.£ 500 gross output at 1976 prices. If, as claimed 400,000 hectares of high potential land could be safely cleared it would provide 800,000 jobs and K.£ 200 million gross output. Of course in practice this would take a long time. The total area planted to tea in Kenya in 1976 was 66,000 hectares. Further as long as there are conflicting use of forest like harboring of wild life for tourism and the unknown environmental effects of replacing forests with parmanent crops this idea is bound to remain of a academic interest.

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10 The President recently appointed a Soil Conservation Committee which could have responsibility for devising these new institutions.

2.4. Dryland Farming.

Four-fifths of Kenya's land area lie in the semi-arid amd arid agro-ecological zones. Twenty five per cent of the total human production and 50% of the livestock in Kenya are found in the marginal areas. Much of the area is devoted solely to pastoralism, but there is increasing migration from densely-populated high-potential areas to sparsely populated marginal areas.

These areas have low potential of generating substantial output and employment (see Table 5). The development strategy in the marginal areas should be to try to raise the living standards of the existing population rather than to try to expand production through immigration. This immigration brings with it technology from high potential areas which is unsuited for the dry areas and tends to lead to degradation of environment.

2.5. Livestock Production.

So far our discussion has concentrated on crop production but at this stage we should also examine the possibilities of increasing animal production. Beef production requires plenty of land which is no longer available. This would call for a shift towards zero grazing which is already being adopted in the high potential areas where land is scarce. The alternative is to shift consumption from beef to milk, sheep and goats. Milk production on small farms using arable food crops and accompanied by high standard of management has high income per hectare, and high employment content. Sheep and goats are small and their quick reproduction patterns lend themselves to the use of crop by-products in small farm units.

Pork and poultry production can also be increased tremendously through division of labor. Cassava production should be promoted in Coastal lowlands and in the highlands the starch so produced should be transformed into pig and poultry products. But this would demand appropriate price policy as well as other institutional arrangements (guaranteed markets etc.) for it to succeed.

Table 5 shows the potential impact on production and employment from the possibilities that have been discussed in Part I of this paper.

In concluding this part of the paper we should reiterate two points that were made by Tidrick (1979) concerning prospects for employment and production growth in agriculture. First, although there is no technical problem in expanding agricultural output and employment sufficiently to accommodate population growth through the rest of the century, there are economic and political obstacles. Agricultural development will require major investments to expand land area, and careful attention to policy and the development of supporting institutions. Changes in Government policy will be essential if the slowing of agricultural growth is to be reserved. Second, while there is no technical problem in the medium term to expanding agricultural output and employment, if population growth does not slow down dramatically by the end of the century then the employment and development problem would only have the Malthusian solution.

However, the development envisaged in Part I of this paper will not be possible without the help of Government policies and support.

II. GOVERNMENT POLICIES AND INSTITUTIONAL SUPPORT.

The generation of output and employment as discussed in Part I of this paper can only be expected to be met through promotion of smallholder farming. In this part of the paper we shall turn our attention to the policies required for smallholder development. These policies include pricing, marketing, research, extension, credit and land policy.

1.1. Pricing Policy:

Kenya has had dramatic changes in price policy. In January, 1975, Kenya moved to adopt world market prices for most agricultural commodities including food grains, though basic agricultural prices are still controlled at geographically and seasonally uniform prices, and extensive controls at farm gate, whole sale, and retail levels still remain (brown, 1978).

Price support system has played a useful role in the past in encouraging innovation by removing the risk of price fluctuations for important crops. But Kenya farmers have become exceptionally price-responsive and very much aware of market opportunities. Thus the Government should review seriously its role in price setting.

TABLE 5: PRODUCTION AND EMPLOYMENT POTENTIAL FROM ALTERNATIVE SOURCES

SOURCE	Maximum Estimate		Moderate Estimate	
	Output £ (Millions)	Employment (Thousands)	Output £ (Millions)	Employment (Thousands)
Irrigation	225	2,000	90	400
Drainage	300	2,000	150	1,000
Clearing of forest	200	800	6	40
Dryland farming	negligible	negligible		
Change in cropping patterns[1]	200	2,750	125	1,750
Increased yields	600	1,000	450	750
Land redistribution[1]	600	3,800	50	870
Total potential increase[2]	1,925	9,600	821	3,940
Increase required by 2000	1,000	3,800	1,000	3,800

Source: Tidrick, G., 1979

1. Change in cropping pattern and land redistribution are not additive.

2. Total excludes smaller of change in cropping patterns or land redistribution. Excluded from total are changes due to increased yields from application of technology not yet developed and intensification due to subdivision of existing small holdings.

Fixed price supports may be justified in cases where the Government is trying to expand production of a new or neglected crop, but in general farmers and consumers would be better off if Government marketing boards played a more restricted role. The boards should set minimum amd maximum support prices for maize amd other key crops but otherwise should permit full private sector competition (Tidrick, 1979).

The price policy has impact on income distribution. Food price controls frequently benefit middle amd upper-income urban groups at the expense of low-income rural producers. A case in point are the price controls on meat and maize which transfer income from low-income herdsmen and farmers for the benefit of middle amd upper-income urban dwellers. Although in the case of maize it is the marketing restriction which often hurt producer and consumer.

However, it must be noted that the scope for price policies is limited due to dependence on exports and the limited purchasing power of the internal market, lack of data on production of most crops and the fact that only a small proportion of crops like maize (10-30%) is marketed through official channels.

1.2. Marketing Policy:

In Kenya the tradition of centralized marketing has been the order of the day. The Government not only provides marketing organizations for many crops, but frequently forbids trade through unauthorised channels. Marketing policy is tied up with pricing policy. There is a pre-announced controlled price for the major crops and single-channel marketing is the principal way in which the Government seeks to make its controlled price effective. In practice there is considerable illegal and semi-legal trade in maize and rice because of inappropriate prices, inadequate storage or high marketing costs.

The storage issue is especially critical. In the recent food shortage in the country, although the shortage is blamed to a combination of bad planning, mismanagement, poor weather, and blantant profiteering a large measure of that blame should have gone to lack of proper attention to storage facilities. The 'Financial Times' had this to say, "Indeed the poor maintenance of storage facilities may have been a factor in the apparent disappearance of the maize reserve. For example, at Nakuru only four out of the 30 silos which form storage for the country strategic reserve, are

properly water and air tight. At Kitale, the other centre for strategic reserve, 10 out of 36 silos are out of commission"[11]. This is probably the situation across the country. But because of uniform maize price through out the year, there is no incentive for private storing by farmers and traders.

The maize marketing system in particular has often been criticized, (Gsaenger and Schmidt, 1977; Smith, 1978), but the Government has been reluctant to change it.

Most smallholder export crops are also sold through specialized single-channel marketing boards or cooperatives, but prices are set by international market less marketing costs. The marketing system has a disequalising effect (Heyer, 1976; Smith, 1978). The export marketing boards were initially set up to protect the interests of white settler farmers but unfortunately the agricultural marketing system still treats large and small farmers very differently. As Heyer (1976) concludes large farms are favored in comparison with small farms in many aspects.

The state promoted agricultural cooperatives probably also have disequalising tendencies. Hyden (1973) in his thorough study on cooperatives found that, Union or Society funds are used for purposes that are contrary to the economic interests of the ordinary producer-member and that many rural people view the cooperatives as designed as a means of control by the rich. Presently most cooperatives in the country are plagued with mismanagement especially in finance and all forms of corruption.

It is clear then that most of the country's trade goes through parastatals and cooperatives which operate without competition, some of which are clearly not as efficient as they could be. In this light then it is imperative that the Government reconsiders the institutional setting in marketing. In some cases it would be economically prudent to allow effective competition between parastatals, cooperatives and private dealing in various crops. The Government has started examining the roles of various parastatals in order to improve their performance. But here the words of Heyer (1976, p. 30) are appropriate when she observed that there are "political interests that prevent changes from being made. There are the vested interests in large scale farming, the vested interests that prevent the marketing system from divesting itself of its large farm bias, the vested interests in the marketing system itself that are against disbanding the centralized organization and the vested interests in cheap and limited credit."

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11 Financial Times supplement on Kenyan Economy, 28th July, 1980.

1.3. Credit Policy

Agricultural credit is provided through commercial banks, cooperatives societies, individual crop authorities and several specialized Government institutions, the most important of which are the Agricultural Settlement Fund (ASF) and the Agricultural Finance Corporation (AFC - to be converted into an Agricultural Bank).

The Kenya credit system has many shortcomings. It has failed to reach most of the small farmers, is improperly integrated into the overall financial system and it charges too low interest rates (Heyer, 1976; Long, 1978). However, there are presently several credit programmes attempting to reach small farmers such as Integrated Agricultural Development Programme (IADP), Small holder Coffee Improvement Programme (SCIP) etc.

The past provision of credit has tended to widen rural income disparities (Heyer, 1976). Smith (1976, p. 132) has also added to this evidence when he notes that, while credit is another ineffective weapon for promoting agricultural development it is a "useful method of redistributing income in favor of those who are fortunate enough to already own sufficient resources to meet the minimum required of credit recipients."

More fundamentally; Kenyan agricultural policy-makers and aid agencies have over-emphasized the role of credit to the neglect of other important development constraints (Von Pischke, 1976).

Thus, there is a great need for the Government to re-orient the policy of the institutions serving agricultural credit to concentrate their service to the majority i.e. the smallholder farmers. The emphasis should also be placed on credit for food production by these farmers rather than on export crops. However, even when emphasising credit for food production we have to reiterate that credit is not a good tool for income redistribution to the poorer farmers but has merits as far as increasing production is concerned.

1.4. Agricultural Research Policy.

Kenya has one of the largest agricultural research establishments in Africa. It allocates a substantial amount of resources to agricultural research. Table 6 shows financial resources allocation to agricultural research in the Fourth Development plan.

The major criticism of agricultural research policy has been its bias towards the problems of large farms and cash crops i.e. coffee, tea, pyrethrum, sisal and wheat. This concentration in large scale farming has tended to exclude the small scale farming which has resulted in negative effects on the distribution of rural incomes.

There has also been a concentration of research activities in the high potential areas and in crops rather than livestock. The consequence has been a widening gap between incomes in the high potential areas and the rest of the country.

But Gerhart (1975) has observed that the development of higher-yielding and drought-resistant strains of maize have been a major outcome of past research, which has been widely applied on small-holdings and, the drought-resistant varieties has been applicable to lower-potential areas. In the period 1964 - 73 production of hybrid maize in Kenya grew from 400 acres to an estimated 800,000 acres a rate of diffusion higher than hybrid corn in the U.S. in the 1930s (Gerhart, 1975). but no such important technological breakthrough are currently available for adoption as is clearly stated in the Fourth-Five-Year Plan (Kenya, 1979). Development of such technologies calls for a substantial increase of investment in agricultural research both in middle and long terms.

Table 6: Agricultural Research provisions (K£) to Government Institutions during the 1979-83 Development plan period

	1978/79	1979/80	1980/81	1981/82	1982/83
Recurrent	5,811,897	6,351,945	7,573,364	8,742,472	9,947,390
Development	3,805,081	4,971,410	4,659,040	4,937,000	5,092,330

Source: Fourth Development Plan, 1979-1983.

The Government has also outlined the direction of future agricultural research in the same plan. It states that "increased emphasis, including greater investment of human and financial resources, will be placed in those lines of agricultural research that are appropriate for land use intensification in small holding and on production techniques for areas of low

and unpredictable rainfall. Research on developing viable mixed crop and livestock systems for arid areas will be emphasized. In the allocation of research resources preference will be given to research which is likely to increase both employment and productivity." (Kenya, 1979, p. 210). But there will be a lag before the intention outlined above become a reality to ameliorate the problem created by past research on income distribution.

The major constraint in the future development of agricultural reserach and its potential contribution to agricultural development is lack of qualified staff. Tightening this constraint of qualified staff is lack of incentive especially the low salaries which are hardly attractive (Ruthenberg, 1978). The Government would therefore need to provide ample finance for agricultural research and to organise it effectively. The present institutional arrangement does not allow competitive salaries but the Government has recognized this and has formed the Kenya Agricultural Research Institute (KARI) [12] which will likely circumvent this problem.

Ruthenberg (1978) contends that the other major problem that seems difficult to solve is that Kenya is endowed with many different climates. This makes it difficult to conduct research on all of them effectively. This would then require that Kenyan researchers keep very much in touch with their counterparts working elsewhere in the tropics so that they can import innovations as soon as they become available.

1.5. Extension Service Policy

Just like Agricultural research Kenya has one of the largest extension service establishments in Africa.[13] The Government also devotes substantial resources to agricultural extension service. There is a close connection between extension service and research in that the latter transmits results to farmers and provides a feedback to researchers on the felt needs of the farmers.

The extension service has pursued what is popularly known as a progressive farmer strategy. This singles out those farmers regarded as most innovative, most likely to respond to advice, for special attention on an individual farmer basis. These farmers are expected to spread the 'gospel' to the rest.

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12 Started by An Act of Parliament in 1979 and located at Muguga, Kenya.

13 The variance in training coupled with a high staff turnover leads one to question the quality of extension service.

All the studies that have analysed this service in Kenya (Ascroft, et al., 1972; Hunt, 1974; Leonard, 1977) have shown that the service is biased towards progressive farmers. There has also been a bias towards farmers who were given land in the Government resettlement schemes. Staudt (1976) has also shown that the service has discriminated against women.

"Female farm managers experience a persistent and pervasive bias in the delivery of agricultural services to which they are entitled. The bias holds under a number of different controls, including economic standing, land size, and demonstrated interest in adopting cash crop promotions in a timely way". (Staudt, 1976, p. 239).

For example, she found that 28% of farms jointly managed by men and women had never been visited by an extension worker, while the proportion was 49% for farms managed by women alone.[14]

The past extension policies have been inegalitarian and also have widened income disparities in agriculture. The progressive farmer approach accentuates this situation. The Tetu experiment, and work elsewhere, has indicated strongly that focussing on 'average' farmers through group extension methods is likely to be more effective (Ng'ethe, et al, 1977; Leonard, 1977; Schonherr and Mbugua, 1974).

The Fourth Development plan has indicated an important shift in policy away from the progressive farmer strategy on individual farm visits, it thus states that "Group extension programmes designed to reach more farmers will become the normal approach." (Kenya, 1979, p. 240).

This approach will definitely face a lot of resistance from well established extension agent who support strongly the progressive farmer strategy as well as the progressive farmers themselves. Just like in Research and other services this will need a lot of political will on the part of the Government as well as clear criteria for selecting group trainees. This approach if it works will definitely help in ameliorating the worsening income distribution in agriculture that has been to some extent created by extension service.

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14 But from Integrated Rural Survey, (IRS I), 1974-75 only 29% of smallholder farms are run by women in the country.

1.6. Land Policy.

Land policy is still one of the most crucial areas of agricultural policy in Kenya today. It is a major political issue and has been for decades. The most controversial land issue concerns the size distribution of holdings. This is not simply the question of large versus small. It is the question of access to large farms, and to a lesser extent the distribution of ownership within both the large and the small farm sectors (Heyer, et al., 1978). We shall review briefly past land policies and then turn to current policy and the future strategy on this policy.

The past land policy since independence has been on the resettlement of European farms continues and has definitely had some impact on income distribution. The increased smallholder production has reduced rural poverty. This transfer of land from Europeans to African has especially reduced racial inequality but on the other hand it has increased substantially inequalities between the resettled farmers and those remaining in their original smallholder areas.

Collier (1978) gives further evidence which shows that the distribution of land in Africanized large farm areas is still highly concentrated and that cooperative settlement have made only a small contribution to income redistribution. For example, in the Mixed-farm area of Nakuru the distribution of all forms of ownership, such as proprietor, cooperative, partnership, private and public company, is highly skewed. With 2% of farmers owning 69% of the world. Of 18,115 owners, 16,500 held plots of slightly more than one hectare while 38 farmers held farms in excess of 400 hectares.

The land tenure reform is a continuing policy of the Government. This policy has tended to improve productivities and incomes of smallholders but has at the same time worsened the incidence of landlessness and increased the concentration of land ownership. The policy can be said to have worsened both poverty and inequality.

The current and future land policy is mainly based on institutional changes. This is mainly the large farm subdivision question. We can expect little change in the institutional set up of the plantation economy i.e. coffee, tea and sisal. The situation however, is different with large scale mixed farms. Here subdivision is going on albeit unofficially. The Fourth Five Year Plan (Kenya, 1979) has clearly spelt the aims of official land

policy which is mainly directed to smallholder development.

"The main lines of Government policy are clear. The small farm family that works on its own land is the main instrument for farm management and rural development. Exceptions to this style of agricultural production exist where economies of scale require other forms of organization as with ranching, wheat farming, sisal and pineapple plantations, and nucleus estates. In the latter cases, the form of organization of the farming system, i.e. cooperative farming, limited liability company, partnerships, etc. Will be determined by efficiency criteria". "The emphasis on the small farm family derived from the evidence that on the whole, small farms produce more per acre, utilize land more fully, employ labor-intensive methods of production, and are a source of subsistence as well as cash crops. The family farm as the focus for agricultural development has three implications which underline more detailed Government policies. First, the family owns its land. Second, the family manages its land. Third, the family works on its land. Ownership of large holdings of land suitable for small farming will therefore be discouraged, and so will be absentee landlords, a landlord-tenant system of farming, and the holding of idle land for speculative purposes". (Kenya, 1979, p. 51, p. 53).

The other measure that has been advocated to reduce concentration of land ownship for speculative purposes is a land tax. This was raised in the Third Five Year Plan (1974-78) and detailed studies are recommended for the Fourth Five Year Plan (1978-1983) to assess the usefulness of and the best way of implementing some form of land taxation (Ministry of Agriculture).

Land tax has many advantages which are well summarised in Ruthenberg's words: "A land tax is the ideal instrument for income distribution without reducing the incentive for the better farmers. It is equitable. It is a minor charge for the man with little land and major charge for the man with much land. It is a minor charge for the good farmer and major one for the poor farmer". (Ruthenberg, 1978, p. 10).

The Government proposes to form a National Land Commission (NLC) and one hopes that it will seriously study the issue of land tax. The NLC should also investigate other policy instruments like land ceiling and capital gains tax to see if they can be used in reducing land concentration and ownership of land for speculative purposes. But again here a lot of political will is called for rather than rhetoric.

2.6. Conclusion.

In conclusion the role of Government in assisting development to agriculture and especially to smallholder development has been emphasized throughout this paper. Nevertheless it should be noted that this role is necessary but not sufficient even when the political will is there.

As Heyer and Waweru (1976, p. 199) have pointed out, "the pace, pattern and character of development in small areas is determined by a whole range of factors, only some of which are subject to influence by Government. The initiative rests with the farmers who can be persuaded but not forced to comply with particular policies". However, the frame-work setting policies concerning prices and markets, land, institutions and organisations is critical to development of agriculture to achieve increased output, employment and hence the distribution income.

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